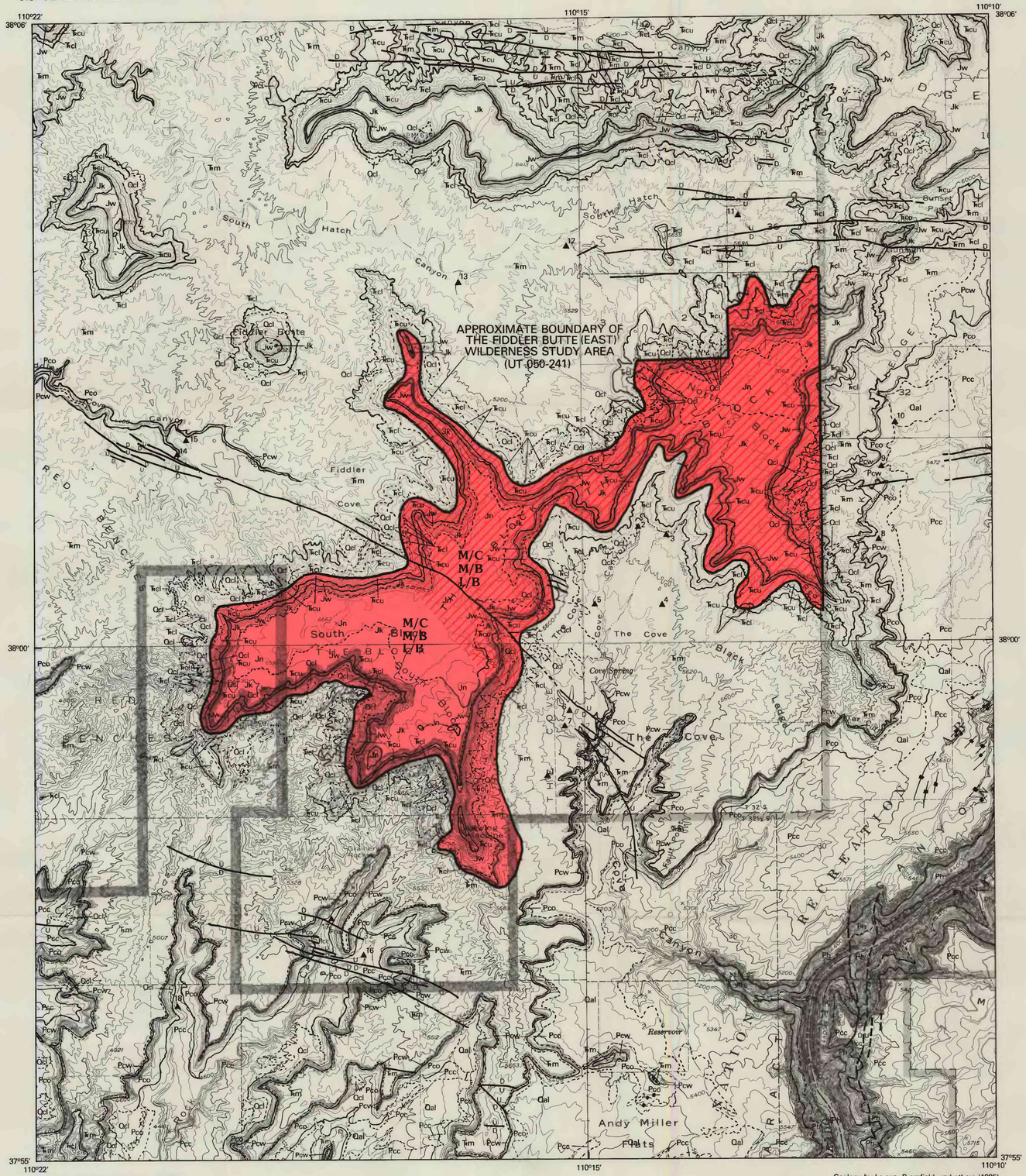
DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

BULLETIN 1759-B
PLATE 1




Base from U.S. Geological Survey 1:62,500
Browns Rim, Mouth of Dark Canyon, 1952,
Fiddler Butte, Orange Cliffs, 1953

Geology by Larson, Bromfield, and others (1985) and Paul P. Orkild, unpublished mapping, 1959

13½° APPROXIMATE MEAN DECLINATION, 1975

SCALE 1:50 000
1 ½ 0 1 2 3 MILES
1 .5 0 1 2 3 KILOMETERS

CONTOUR INTERVAL 40 AND 80 FEET
DATUM IS MEAN SEA LEVEL

UTAH

## EXPLANATION OF MINERAL RESOURCE POTENTIAL

**Geologic terrane having identified tar sand resources**—Applies to the northeastern part of study area

**M/C** **Geologic terrane having moderate mineral resource potential for tar sand (applies to southwestern part of study area) and uranium and vanadium (applies to entire study area), with certainty level C**

**M/B** **Geologic terrane having moderate mineral resource potential for oil and gas and precious (gold and silver) metals, with certainty level B**—Applies to entire study area

**L/B** **Geologic terrane having low resource potential for geothermal energy and all metals other than those noted above, with certainty level B**—Applies to entire study area

**Levels of certainty**

**B** **Available information suggests level of resource**

**C** **Available information gives good indication of level of mineral potential**

## CORRELATION OF MAP UNITS

| | | |
|---|---|---|
| Qal, Qcl | Holocene | QUATERNARY |
| Unconformity | | |
| Jn, Jk, Jw | Lower Jurassic | JURASSIC |
| Unconformity | | |
| Trcu, Trcl | Upper Triassic | TRIASSIC |
| Unconformity | | |
| Trm | Middle(?) and Lower Triassic | TRIASSIC |
| Unconformity | | |
| Pcw, Pco, Pcc, Ph | Lower Permian | PERMIAN |
| Unconformity | | |
| IPh | Upper and Middle Pennsylvanian | PENNSYLVANIAN |

## DESCRIPTION OF MAP UNITS

Qal **Alluvium (Holocene)**—Poorly sorted deposits of clay, silt, sand, and gravel along stream courses

Qcl **Colluvium (Holocene)**—Boulders, gravel, sand, and mud in landslide deposits, Toreva blocks, and eolian sand and silt; thickness 0–100 ft or more

Jn **Navajo Sandstone (Lower Jurassic)**—Light-gray to light-orange, fine- to medium-grained, well-sorted sandstone; thickly crossbedded; locally contains minor lenses of mudstone, cherty limestone, or dolomite; cliff-former; eolian and minor playa deposits; approximate thickness 250–450 ft

Jk **Kayenta Formation (Lower Jurassic)**—Reddish-orange to reddish-brown, fine- to medium-grained, crossbedded sandstone, and laminated sandy siltstone; interbedded with minor limestone and mudstone; forms ledges and steep slopes; largely fluvial deposits, locally includes overbank, lacustrine, sabkha, and eolian deposits; approximate thickness 200–260 ft

Jw **Wingate Sandstone (Lower Jurassic)**—Reddish-pink to reddish-orange, very fine grained to fine-grained, crossbedded sandstone; forms cliffs; eolian deposits; approximate thickness 280–400 ft

**Chinle Formation (Upper Triassic)**—Divided into two parts, each containing several members

Trcu **Upper part, undivided**—Comprises Church Rock, Owl Rock, and Petrified Forest Members:
**Church Rock Member**—Reddish-brown to reddish-orange siltstone; irregularly ripple laminated to thick bedded; interbedded with cross-stratified, fine- to coarse-grained sandstone; locally contains thin- to thick-bedded conglomerate and arkosic sandstone; fluvial and lacustrine deposits; approximate thickness 80–200 ft
**Owl Rock Member**—Pale-red to pale-reddish-brown siltstone and mudstone; thin- to medium-bedded; interbedded with pale-red to light-greenish-gray, thin- to medium-bedded, cherty limestone; locally contains limestone breccia; lacustrine deposits; approximate thickness 120–200 ft
**Petrified Forest Member**—Variegated bentonitic claystone; interbedded with minor amounts of clayey siltstone and fine- to medium-grained sandstone; fluvial and lacustrine deposits; approximate thickness 50–200 ft

Trcl **Lower part undivided**—Comprises Moss Back, Monitor Butte, and Shinarump Members:
**Moss Back Member**—Yellowish-gray to pale-orange, thin- to thick-bedded, structureless to cross-stratified, fine- to medium-grained sandstone; locally contains lenses of pale-green claystone and siltstone and lenses of chert- and limestone-pebble conglomerate; fluvial deposits; thickness ranges from 0 to 165 ft
**Monitor Butte Member**—Variegated to predominantly greenish-gray, micaceous, bentonitic mudstone; also contains fine-grained, grayish-green sandstone; locally contains limestone-pebble conglomerate; locally contains uranium and vanadium; fluvial, lacustrine-deltaic, and lacustrine deposits; thickness ranges from 0 to 265 ft
**Shinarump Member**—Gray to yellowish-gray, medium- to thick-bedded, cross-stratified, fine-grained to conglomeratic sandstone; contains minor gray to red mudstone; locally contains uranium and vanadium; fluvial deposits; thickness ranges from 0 to 50 ft

Trm **Moenkopi Formation (Middle(?) and Lower Triassic)**—Pale-red to reddish-brown, thin to thick-bedded, very fine grained to fine-grained, crossbedded sandstone; also contains pale- to medium-brown, thin-bedded silty mudstone and limestone; locally contains brown to medium-brown, coarse-grained, lenticular conglomerate at base; marine, tidal flat, and lagoonal deposits; approximate thickness 300–500 ft

**Cutler Group (Lower Permian)**—Divided into three units

Pcw **White Rim Sandstone**—Light-gray to white, very fine grained to fine-grained sandstone; laminated to very thin bedded, crossbedded; forms cliffs; thins eastward and pinches out depositionally near Colorado River; marginal marine and eolian deposits; approximate thickness 35–250 ft

Pco **Organ Rock Formation**—Moderate- reddish-brown sandstone, siltstone, and mudstone; laminated to thin bedded; forms slopes with cliff at top; probable marginal marine deposits; approximate thickness 250–400 ft

Pcc **Cedar Mesa Sandstone**—White to pale-reddish-brown sandstone; thickly crossbedded; forms a cliff; marginal marine eolian deposits; approximate thickness 200–300 ft

Ph **Halgaito Formation (Lower Permian)**—Reddish-brown to purple, arkosic sandstone, interbedded with red siltstones and conglomerates, and gray limestones; fluvial to marginal marine and marine deposits; forms ledges and slopes; approximate thickness 400–550 ft

IPh **Honaker Trial Formation (Upper and Middle Pennsylvanian)**—Dark-gray, thick-bedded limestones interbedded with gray cherty limestones and red to gray shales and sandstones; forms ledges and slopes; marine to marginal marine deposits; approximate thickness 1,000–1,500 ft

**Contact**—Dashed where approximately located

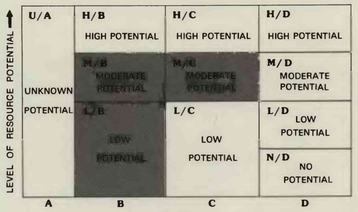
**Normal fault**—Dashed where approximately located; U, upthrown side; D, downthrown side

**Strike of vertical joints**

**Mine or prospect**

▲12 **Geochemical sample locality**

**Boundary of Glen Canyon National Recreation Area**




LEVELS OF RESOURCE POTENTIAL

**H** High mineral resource potential
**M** Moderate mineral resource potential
**L** Low mineral resource potential
**U** Unknown mineral resource potential
**N** No known mineral resource potential

LEVELS OF CERTAINTY

**A** Available data not adequate
**B** Data indicate geologic environment and suggest level of resource potential
**C** Data indicate geologic environment, give good indication of level of resource potential, but do not establish activity of resource-forming processes
**D** Data clearly define geologic environment and level of resource potential and indicate activity of resource-forming processes in all or part of the area

Diagram showing relationships between levels of mineral resource potential and levels of certainty. Shading shows levels that apply to this study area

# MAP SHOWING THE MINERAL RESOURCE POTENTIAL AND GEOLOGY OF THE FIDDLER BUTTE (EAST) WILDERNESS STUDY AREA, GARFIELD COUNTY, UTAH